ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	
Preparation for International Telecommunication Union World Radiocommunication Conferences	IC Docket No. 94-31

COMMENTS OF ORBITAL COMMUNICATIONS CORPORATION

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SUMMARY

ORBCOMM believes the United States was very successful in gaining worldwide acceptance at WARC-92 of allocations for low-Earth orbit ("LEO") satellite systems. ORBCOMM urges the Commission at WRC-95 to attempt to build on that progress, and not to allow WRC-95 to become a retreat from that success. Thus, ORBCOMM suggests that the Commission both seek affirmative steps to foster the deployment and growth of below 1 GHz LEO satellite services, and seek the defeat of proposals that might hinder the development of below 1 GHz LEO satellite services.

With respect to this latter category of actions, ORBCOMM strongly urges the Commission to oppose the global adoption of the operating restrictions imposed in the United States in FNs US 323 and US 325. Those restrictions are overly conservative, and could retard the development of below 1 GHz LEO satellite service if they are imposed on a global basis. Those restrictions were selected arbitrarily, and are not derived from actual operating results. "Codification" of those restrictions by adopting them as worldwide restrictions would make it unnecessarily difficult to alter them over time as the lack of a need for those restrictions becomes more apparent.

In a similar vein, the United States should reject efforts to alter significantly the procedures for international coordination of LEO satellite systems as suggested by the Voluntary Group of Experts. ORBCOMM's own experiences with the Resolution 46 procedures demonstrates that they can be an

effective means of facilitating international coordinations of these truly global systems. Likewise, ORBCOMM believes that some clarification of the cross-border coordination triggers may be helpful in order to preclude that requirement from becoming a source of delay in the deployment of LEO satellite services.

ORBCOMM also recommends that the United States seek additional allocations of spectrum below 1 GHz to support the expected growth in demand for these services. While the initial allocations made at WARC-92 will allow the current applicants to deploy their first generation systems, the presence of additional likely entrants from the United States and elsewhere, along with the expected rapid growth in demand, means that additional spectrum will soon be needed. By beginning the allocation process at WRC-95, the United States can help ensure that added spectrum will be available in the years ahead.

Finally, ORBCOMM makes several suggestions to improve the preparation process within the United States so as to enhance the effectiveness of the United States at WRC-95 and future radiocommunication conferences, which will now be occurring every two years. By organizing the advisory groups by subject matter, the assistance of the private sector can be more effectively focussed. In addition, ORBCOMM strongly urges the U.S. government to reject restrictions on the size of the U.S. delegation -- the United States can ill afford not to have adequate resources and personnel at these critical international telecommunications conferences. Only through thorough

participation can the United States ensure that the U.S. interests are fully considered.

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Orbital Communications Corporation ("ORBCOMM"), a wholly-owned subsidiary of Orbital Sciences Corporation ("OSC"), hereby comments on the Notice of Inquiry ("NOI") addressing the upcoming 1995 World Radiocommunication Conference ("WRC-95").[1/] As a leader in the development of commercial low-Earth orbit ("LEO") mobile satellite services, ORBCOMM is very interested in this proceeding. ORBCOMM has been an active participant in previous World Radiocommunication Conference proceedings at the Commission, and at the World Radiocommunication Conferences themselves.

ORBCOMM was formed by its parent company to enter the mobile satellite services business. Founded in 1982, OSC is one of the country's leading commercial space technology companies. It is engaged in design, manufacturing, testing and operation of

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1/ Preparation for International Telecommunication Union World Radiocommunication Conferences, IC Docket No. 94-31, FCC 94-96, released May 5, 1994 ("NOI").

space launch vehicles, suborbital tracking and data systems, and satellite-based communications and remote sensing systems.

In February 1990, ORBCOMM submitted to the Commission a petition for amendment of Section 2.106 of the rules to establish a mobile satellite service for two-way data communications and position determination using low-Earth orbit ("LEO") satellites, along with an application for authority to construct such a satellite system.[2/] In response to the ORBCOMM petition for rulemaking, the Commission has allocated spectrum for the new service,[3/] and has completed a rulemaking to develop the licensing and service rules, using the FCC's negotiated rulemaking procedures for the first time.[4/]

Largely through the efforts of ORBCOMM and the U.S. government, the agenda for the 1992 World Administrative Radio Conference ("WARC-92") included consideration of a global allocation of spectrum below 1 GHz for non-geostationary mobile satellite services. Representatives from ORBCOMM served as

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2/ Orbital Communications Corporation, RM No. 7334, Public Notice Report No. 1814, April 4, 1990; Orbital Communications Corporation, File No. 22-DSS-MP-90(20), Public Notice Report No. DS-953, April 11, 1990. In addition, ORBCOMM has received authority to launch two satellites for a developmental program, which will be placed into orbit later this year. Experimental Licenses KE2XER, KE2XES, KE2XET, KE2XEY, KE2XFS and KE2XFT.

3/ Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites, ET Docket No. 91-280, FCC 93-29, released February 5, 1993.

4/ Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile Satellite Service, CC Docket No. 92-76, FCC 93-478, released November 16, 1993.

advisors to the U.S. delegation at WARC-92, and participated in the conference in Torremolinos, Spain.

As a result of the work of ORBCOMM and the U.S. delegation, as well as the high level of interest from many other nations, WARC-92 allocated spectrum for non-geostationary mobile satellite services.[5/] Subsequently, in setting the agenda for WRC-95, the 1993 World Radiocommunication Conference included the topic of mobile satellite services below 3 GHz and the need to review the technical constraints for those services. Thus, the NOI seeks input from the public in order to assist the Commission in developing a U.S. position on mobile satellite service issues for WRC-95, including follow-on matters from WARC-92 and additional spectrum allocations for mobile satellite services. As detailed below, ORBCOMM urges the Commission not to make any significant changes to the procedures or operating parameters for LEO satellite services. ORBCOMM also urges the Commission to seek additional global allocations of spectrum in the bands below 1 GHz for LEO satellite services.

5/ WARC-92 designated some 9.9 MHz of spectrum below 1 GHz for non-geostationary mobile satellite services. However, only 3.6 MHz was allocated on a primary or co-primary basis, with the other 6.3 MHz allocated on a secondary basis. The need to share the spectrum with other services will constrain the ability of the non-geostationary mobile satellite systems to use those allocations.

A. The Commission Should Not Attempt to Seek Worldwide Adoption of the U.S. Operating Restrictions on Below 1 GHz LEO Services

ORBCOMM strongly opposes the Commission's suggestion that the U.S. restrictions on Non-Voice, Non-Geostationary MSS operations below 1 GHz ("NVNG MSS"), currently in the table of allocations in footnotes US 323 and US 325, be proposed for worldwide adoption. Despite the Commission's belief that international operating restrictions incorporated into international footnotes might facilitate worldwide implementation of NVNG MSS, ORBCOMM believes that such a strategy would be unnecessary and counter to the United States' interests.

ORBCOMM understands the genesis of the footnotes within the United States -- the terrestrial government users were concerned about interference from a new satellite technology. The operating and duty cycle restrictions that were adopted, however, are overly conservative. Indeed, the restrictions impede the ability of the NVNG MSS service provider to meet many subscribers' needs by unnecessarily limiting the length of any single message and making it exceedingly difficult to send longer messages since they must be sent over different channels.

ORBCOMM is concerned that the United States might advocate these current domestic restrictions at WRC-95, because the particular values that were selected are arbitrary, and not derived from any experiences or tests that ORBCOMM is aware of. In contrast to the absence of analysis supporting the US 323 and US 325 restrictions, ORBCOMM has been conducting simulations of

its Dynamic Channel Activity Assignment System ("DCAAS") operating method, which is intended to avoid interference, utilizing actual information on use of the band obtained through its experimental satellite program. ORBCOMM believes that its analysis establishes the ability of ORBCOMM's system to avoid harmful interference to the terrestrial users, without the need to resort to the overly restricted duty cycle limits in US 323 and US 325. Moreover, ORBCOMM expects to launch its first two operational satellites in the very near future, so that there will shortly be the opportunity to measure the need for any restrictions or set those values based on actual usage information.[6/]

Thus, ORBCOMM believes that at best it is premature to adopt any specific restrictions on a worldwide basis, given the limited basis for the values that were selected to protect the U.S. government terrestrial users. Incorporating the present U.S. restrictions into the allocation table as an international footnote would have the unfortunate effect of globally "codifying" what ORBCOMM believes are overly restrictive operating limits. Once incorporated into an international footnote, it will become exceedingly difficult to modify those restrictions.

6/ In light of the new policy of convening radiocommunication conferences every two years, the need for restrictions or the particular values imposed could be addressed at a future WRC if it proves desirable or necessary. Under this scenario, any decisions could then be based on actual operating information instead of fear, conjecture or speculation.

ORBCOMM urges the Commission instead to maintain the status quo, where the NVNG MSS operator can address any particular concerns on a country-by-country basis. ORBCOMM has already met with numerous governments in seeking to implement its system, and believes that this is a much better means of securing the necessary approvals. Such a course of action will allow ORBCOMM to continue to demonstrate to any concerned government the ability of the ORBCOMM DCAAS system to allow sharing with terrestrial users. Alternatively, to the extent that any restrictions are desired, they can be designed to accommodate the particular users and concerns within a specific country.

This approach of continuing the present processes avoids the blanket, worldwide application of unnecessary and overly conservative restrictions. Those restrictions, particularly if applied on a global basis, are likely to hamper the ability of NVNG MSS to operate effectively and efficiently, which could jeopardize the enormous benefits of LEO satellite systems. Thus, ORBCOMM urges the Commission to oppose an international footnote incorporating the current U.S. restrictions. Such a position will help ensure that the valuable services, new jobs and export opportunities made available by LEO satellite systems will be fully realized.

B. The United States Should Seek Only Minor Changes in the Procedures for International Coordination of LEO Satellite Systems

The NOI seeks comment on the apparent reformulation by the Voluntary Group of Experts ("VGE") of the procedures established at WARC-92 in Resolution 46 for international coordination of non-geostationary satellite systems.[7/] ORBCOMM believes that while some clarification of the current procedures would be appropriate, its own experience to date indicates that the Resolution 46 processes are a workable and efficient means of attaining international coordination.

As the Commission recognizes, the Resolution 46 procedures avoid the need for country-by-country notification, which would be a difficult and time-consuming task for LEO satellite systems that will overfly all of the world. In addition, by establishing various deadlines, including ones for expressions of a desire to coordinate, the Resolution 46 procedures limits the risk that international coordinations for LEO satellite systems will drag on endlessly. ORBCOMM therefore urges the Commission to oppose any VGE proposals which would make significant changes to the Resolution 46 procedures for international coordination of LEO satellite systems.

7/ NOI at n. 9.

C. The United States Should Seek Modification or Clarification of the -150 dBW/m^2/4 kHz Limit

During the conduct of the international coordination of the ORBCOMM satellite system, it has become apparent that there is confusion regarding the application of the -150 dBW/m^2/4 kHz limit contained in FN 608A and FN 608B. ORBCOMM therefore urges the Commission at WRC-95 to propose modifications or clarifications of these two footnotes. ORBCOMM suggests that these footnotes should be applied in the same manner in which border sharing arrangements are dealt with today. ORBCOMM does not believe that the terrestrial transceivers used in connection with low-Earth orbit satellites require any different or special treatment.

D. Allocation Issues

The Commission seeks input on any allocation issues that may properly be considered at WRC-95.[8/] ORBCOMM recognizes that some of the LEO satellite system allocation issues may be deferred until WRC-97, but believes that the United States should seek additional allocations at WRC-95 both because of the need for additional spectrum below 1 GHz for LEO satellite systems, and because of the need to ensure that the allocations do not occur later than WRC-97. In addition, there are some steps the

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8/ NOI at paras. 26-27.

United States can seek at WRC-95 that will make the previously allocated spectrum more useful.

ORBCOMM believes that while the initial allocation of spectrum below 1 GHz for LEO satellite services will allow several systems to implement their first generation systems, the current spectrum will be inadequate to accommodate the anticipated growth in the number of systems and the level of capacity demanded by the NVNG MSS systems' subscribers. ORBCOMM expects to experience significant increases in subscribers once the capabilities of LEO satellite systems have been demonstrated through the deployment of commercial systems. In order to meet that surge in demand, ORBCOMM will need to construct larger, more sophisticated second-generation spacecraft that will be capable of providing significantly greater capacity.

In order to make full use of such an advanced satellite system, ORBCOMM will need access to additional spectrum. While ORBCOMM has been able to successfully coordinate its use of the limited spectrum with other systems, the sharing criteria agreed to by all of the parties requires compromises that impact adversely the capacity of each of the systems. In addition, ORBCOMM expects that other countries will also seek to launch below 1 GHz LEO satellite systems. Numerous countries have expressed a heightened interest in this new technology, and are likely to authorize additional systems.[9/]

9/ Outside the United States (which has begun ITU coordination for three systems), seven systems from four countries have been (continued...)

In order to meet the growth in demand and allow the current applicants' systems to better serve their customers, ORBCOMM urges the United States to seek several international allocations at WRC-95. These issues should be rather non-controversial, and so could be implemented at WRC-95 (rather than awaiting WRC-97). First, ORBCOMM urges the United States to seek to advance the change of the status of the Transit Band spectrum (149.9-150.05 MHz) from secondary to primary in light of the earlier retirement of the Transit satellites. ORBCOMM suggests that it would be appropriate to make that change effective January 1, 1996 rather than January 1, 1997.

In a similar vein, ORBCOMM urges the United States to seek an international allocation of the 399-400.15 MHz band to LEO satellite services. This band is allocated to NVNG satellite services within the United States, but not on a global basis. ORBCOMM believes that the United States would be successful in seeking such a global allocation at WRC-95, and need not await WRC-97 to obtain such a relatively small global allocation.

Another relatively minor change to the below 1 GHz LEO service allocations that the United States would likely have success with at WRC-95 is a modification of the 149.9-150.05 MHz allocation to specify that the band can be used for generic mobile satellite services, rather than limited to land mobile

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9/ (...continued)
advance published. Indeed, in addition to the United States, some twelve countries have announced below 1 GHz satellite systems: Australia, Belgium, Brazil, France, Germany, India, Italy, Korea, Mexico, Russia, Tonga and Uganda.

satellite services as currently written. The demand for LEO satellite services is likely to extend beyond land mobile services to include maritime or aeronautical services as well. The current restriction needlessly hampers the ability of the LEO satellite service provides to meet the demand for additional services.

Finally, as indicated in the NOI, the Commission should continue to explore additional allocations below 1 GHz already allocated to non-government use. Given the high level of interest in below 1 GHz LEO satellite systems and the expected rapid growth in subscribers, ORBCOMM expects that in order to meet market demand, an additional allocation of 10 MHz of usable spectrum will be needed by 2005, with an additional 10 MHz needed by 2010. In order to ensure the availability of spectrum in that time frame, global allocations are necessary at WRC-95 (or WRC-97 at the latest) in order to permit administrations the opportunity to provide any necessary transitions for affected users or take whatever steps are needed to allocate the spectrum for this service within their country.

While it may be difficult to obtain "wholly new" allocations at WRC-95, the efforts initiated at WRC-95 may pay dividends in the form of additional allocations at WRC-97. Also, ORBCOMM urges the Commission to continue its discussions with NTIA with regard to shared government/non-government use of spectrum below 1 GHz presently allocated to government use only, and if those discussions result in agreement on their suitability

for LEO satellite services, to seek such allocations at WRC-95 and WRC-97. With such spectrum sharing, government users can obtain new telecommunications services without the need to expend large amounts of taxpayer funds for development, construction and operation. ORBCOMM will also continue to review the use of other spectrum below 1 GHz to determine whether there are any additional bands that would be suitable for LEO satellite services.

In sum, by beginning the process of global allocations at WRC-95, the United States can help ensure that future spectrum needs can be met in a timely manner even if all of the spectrum is not allocated during the next radiocommunication conference. In addition, the "relatively minor" suggested changes to the current allocations can be accomplished at WRC-95, thereby enhancing the utility of the current allocations. By taking these steps, the United States will advance the deployment of LEO satellite services, and thereby promote the public interest.

E. Preparations for Future WRCs

The NOI also seeks comments on improvements that can be made to the U.S. WRC preparation processes in light of the new, two-year cycles for international radiocommunication conferences. ORBCOMM, having participated in the preparations for WARC-92, offers several suggestions to improve the means for development of U.S. positions to be advocated at future WRCs.

For WARC-92, the activities of the Industry Advisory Committee and the industry/government delegation planning sessions were organized, for the most part, on the basis of comprehensive review and discussion meetings that dealt with all WARC proposals on all topics. The effect of this approach was to cause contributors and interested parties to devote major amounts of time waiting for their specific agenda item to be addressed. ORBCOMM proposes instead that the preparatory process be organized on an issue basis, whereby smaller industry/government teams can focus on specific allocation and regulatory matters in parallel up until the final delegation review sessions. During the presentations for WARC-92, this approach was adopted only at the ad hoc working group level. By organizing as suggested, the process can be streamlined through more efficient use of participants' time and interaction through smaller, more manageable working groups.

ORBCOMM recognizes that this approach could require that the leadership of the industry and government teams meet regularly to assure coordination across issue boundaries. However, ORBCOMM believes that the overall time required of all parties would be reduced by this approach when compared to the process used to prepare for WARC-92. This suggested team approach to be used for preparations could then be carried over into the WRC process itself, with the team leaders and the basic support structure that prepared the U.S. positions representing the United States at the conferences. This type of organization

might also serve to reduce the U.S. management "overhead" at conferences to a head of delegation plus four matrixed vice heads of delegation. The vice heads would be responsible to coordinate and oversee the negotiations and activities of the issue teams with respect to regulatory, allocation, technical and editing matters. These issue teams could be established on a semi-permanent basis with chairs and committee heads, if required, appointed for periods of two years. This structure would address the requirement to maintain a core preparation capability needed to cope with the biennial WRC schedule. The Radiocommunications Study Groups operate on an on-going basis in a similar manner.

ORBCOMM also is concerned about the limitation of government representation at World Radiocommunication Conferences to ten persons. As part of an ad hoc industry group, our concerns have been expressed to officials at the Department of State and the Administration. At WRCs, the United States is faced with competition from countries and alliances of countries around the world who will have the capability to out maneuver the U.S. team if it is limited to only ten persons. Industry representatives are not authorized to speak for the U.S. government, although their presence and support is essential to explain the U.S. positions and to provide the required technical back-up. The structure of WRCs requires the simultaneous presence of government participants at multiple working sessions and other events. A ten person U.S. team cannot possibly cover these activities and be knowledgeable about the numerous

negotiations going on at any one time. By limiting the U.S. delegation, the United States would be abdicating its influential position to the Europeans (i.e., CEPT) and other foreign delegations who have the personnel resources and are willing to expend the relatively modest sums to engage simultaneously all the important regulatory, allocation, technical and editing requirements that arise at radiocommunication conferences. The European presence poses a special challenge to the United States, as with almost 50 member states of the CEPT, the unified European position would outnumber the U.S. presence by over 50 to 1. ORBCOMM therefore urges the U.S. government to rescind or waive the ten person restriction at WRCs and decide upon the appropriate delegation size based on the agenda content of each conference.

CONCLUSION

ORBCOMM believes that largely through the efforts of the United States, WARC-92 was successful in initiating global commercial low-Earth orbit satellite services. The Commission should not allow WRC-95 to become a retreat from those victories, by stifling the development of LEO satellite services through the imposition of the US 323 and US 325 restrictions, or through significant reform of the Resolution 46 procedures. In addition, the United States can further advance the public interest by seeking the allocation of additional spectrum at WRC-95 (recognizing that some of those efforts may not come to fruition until WRC-97). Finally, the United States can enhance its

effectiveness through the suggested procedural reforms. By taking all of these actions, the Commission will ensure that all of the benefits of LEO satellite services can be realized in the United States, including the creation of new jobs, the provision of valuable services to unserved and underserved markets, and the development of export opportunities.

Respectfully submitted,

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